CLAIMS

1.   A method for identifying a test agent as reducing apoptosis of a macrophage cell comprising:

5   (a)   providing:

(i)   macrophage cells; and

(ii)   a test agent; and

(b)   contacting said macrophage cells in the presence of said test agent to produce contacted macrophage cells and in the absence of said test agent to produce control

10   cells; and

(c)   detecting reduced activity of Protein Kinase R in said treated cells compared to Protein Kinase R in said control cells, wherein said detecting identifies said test agent as reducing apoptosis of macrophage cells.

15   2.   A method for identifying a test agent as reducing apoptosis of macrophage cells, comprising:

(a)   providing:

(i)   macrophage cells; and

(ii)   a test agent;

20   (b)   contacting said macrophage cells in the presence of said test agent to produce contacted macrophage cells and in the absence of said test agent to produce control cells; and

(c)   detecting reduced activity of Toll-like Receptor-4 in said treated cells compared to Toll-like Receptor-4 in said control cells, wherein said detecting

25   identifies said test agent as reducing apoptosis of macrophage cells.

3.   The methods of Claim 1 and Claim 2 further comprising, d) identifying said test agent as anti-bacterial.

30   4.   A method for reducing apoptosis of macrophage cells, comprising reducing the activity of a Protein Kinase R.

5.   A method for reducing apoptosis of macrophage cells, comprising reducing the activity of a Toll-like Receptor-4.

6.   A method for reducing apoptosis of macrophage cells, comprising:

(a)   providing:

(i)   macrophage cells; and

(ii)   an agent that reduces activity of Protein Kinase R; and

(b)   contacting said macrophage cells with said agent under conditions such that said agent reduces activity of said Protein Kinase R.

7.   A method for reducing apoptosis of macrophage cells, comprising:

(a)   providing:

(i)   macrophage cells; and

(ii)   an agent that reduces activity of Toll-like Receptor-4; and

(b)   contacting said macrophage cells with said agent and without said agent under conditions such that said agent reduces activity of said Toll-like Receptor-4.

8.   The method of Claim 6, wherein said macrophage cells are contacted with a molecule chosen from one or more of lipopolysaccharide, lipoteichoic acid, *Yersinia pseudotuberculosis* YopJ protein, and protein expressed by the *Salmonella typhimurium* SPI2 locus.

9.   The method of Claim 6, wherein said macrophage cells are contacted with a bacterium.

10.   The method of Claim 9, wherein said bacterium is gram-negative.

11.   The method of Claim 10, wherein said gram-negative bacterium is one or more of *Yersinia species, Salmonella typhimurium,* and *H. influenza.*

12.   The method of Claim 9, wherein said bacterium is gram-positive.

13.   The method of Claim 12, wherein said gram-positive bacterium is a *B. anthracis.*

14.   The method of Claim 6, wherein said macrophage cells are contacted with one or more of dsRNA and virus prior to contacting with a molecule chosen from one or more of

5   lipopolysaccharide, lipoteichoic acid, *Yersinia pseudotuberculosis* YopJ protein, and protein expressed by the *Salmonella typhimurium* SPI2 locus.

15.   The method of Claim 6, wherein said macrophage cells are contacted with one or more of dsRNA and virus prior to contacting with a bacterium.

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16.   The method of claim 13, wherein said virus comprises *Influenza virus.*

17.   A method of treating a microbial infection in a cell, comprising:
         a) providing:

15   i) a cell with one or more symptoms of a microbial infection and
                        ii) a formulation comprising a Protein Kinase R inhibitor; and
         b) administering said formulation to said cell under conditions such that said one or more symptoms of a microbial infection are reduced.

20   18.   The method of Claim 17, wherein said cell has a microbial infection associated with one or more symptoms of a viral infection.

19.   The method of Claim 17, wherein said microbe is a bacterium.

25   20.   The method of Claim 19, wherein said bacterium is selected from a group comprising *Bacillus species, Yersinia species, Salmonella species, Shigella species, Streptococcus species* and *Haemophilus species.*

21.   The method of Claim 18, wherein said virus is selected from a group comprising

30   *Influenzavirus A, Influenzavirus B,* and *Influenzavirus C.*

22.   The method of Claim 17, wherein said infection is a multiple infection.

23.   The method of Claim 22, wherein said multiple infection comprises a bacteria infection and a virus infection.

5   24.   The method of Claim 23, wherein said virus is selected from a group comprising *Influenzavirus A, Influenzavirus B,* and *Influenzavirus C.*

25.   The method of Claim 17, wherein said cell is in a patient.

10   26.   The method of Claim 25, wherein said patient comprises one or more of an animal and a human.

26.   The method of Claim 25, wherein said patient has a microbial infection associated with one or more symptoms of a viral infection.

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27.   A method of treating a microbial infection in a patient, comprising:
        a) providing:
                i) a patient with one or more symptoms of a microbial infection and
                ii) a formulation comprising a Protein Kinase R inhibitor; and
20   b) administering said formulation to said patient under conditions such that said one or more symptoms of a microbial infection are reduced.

28.   The method of Claim 27, wherein said patient has a microbial infection associated with one or more symptoms of a viral infection.

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29.   The method of Claim 18, wherein said infection is a bacterial infection.

30.   The method of Claim 29, wherein said bacterium is selected from a group comprising *Bacillus species, Yersinia species, Salmonella species, Shigella species,*
30   *Streptococcus species* and *Haemophilus species.*

31.   The method of Claim 28, wherein said virus is selected from a group comprising

Influenzavirus A, Influenzavirus B, and *Influenzavirus C.*

32.   The method of Claim 27, wherein said infection is a multiple infection.

5   33.   The method of Claim 32, wherein said multiple infection comprises a bacteria infection and a virus infection.

34.   The method of Claim 33, wherein said virus is selected from a group comprising *Influenzavirus A, Influenzavirus B,* and *Influenzavirus C.*

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